

In the claims:

1. (previously presented) A hydrogel precursor composition comprising:

(a) a polymer comprising a water soluble polymer domain with at least two hydrophobic interacting groups attached thereto, wherein said hydrophobic interacting groups bind strongly to each other in an interchain manner to form a hydrogel under physiological conditions; and

(b) a physical chemical protecting group that inhibits gel formation of said polymer by preventing said hydrophobic interacting groups from binding strongly in an interchain manner.

2. (previously presented) A hydrogel or hydrogel precursor composition comprising:

(a) a polymer comprising a water soluble polymer domain with at least two hydrophobic interacting groups attached thereto, wherein said hydrophobic interacting groups bind strongly to each other in an interchain manner to form a hydrogel under physiological conditions;

(b) a physical chemical protecting group that inhibits gel formation of said polymer by preventing said hydrophobic interacting groups from binding strongly in an interchain manner; and

(c) a molecule that disrupts an interaction between said physical chemical protecting group and said hydrophobic interacting groups.

3. (previously presented) The hydrogel precursor composition of claim 1, wherein said polymer domain comprises poly(ethylene glycol), poly(vinyl alcohol), poly(vinyl pyrrolidone), poly(ethyl oxazoline), poly(acrylic acid), poly(acrylamide), poly(styrene sulfonate), poly(amino acids), polysaccharides, or copolymers thereof.

4. (currently amended) The hydrogel precursor composition of claim 1, wherein said physical chemical protecting group is β -cyclodextrin.

5. (original) The hydrogel precursor composition of claim 1, wherein said hydrophobic interacting groups are positioned at the termini of said polymer domain.

6. (original) The hydrogel precursor composition of claim 1, wherein said hydrophobic interacting groups are positioned within said polymer domain.

7. (original) The hydrogel precursor composition of claim 1, wherein said hydrophobic interacting groups are hydrocarbons.

8. (original) The hydrogel precursor composition of claim 5, wherein said hydrocarbons are perfluorinated hydrocarbons.

9. (original) The hydrogel precursor composition of claim 1, wherein said physical chemical protecting group is a cyclodextrin.

10. (original) The hydrogel precursor composition of claim 1, wherein said physical chemical protecting group is a molecule that covalently binds to said hydrophobic interacting groups.

11. (previously presented) The hydrogel precursor composition of claim 10, wherein said molecule that covalently binds to said hydrophobic interacting groups is hydrophilic.

12. (previously presented) The hydrogel precursor composition of claim 1, wherein said polymer domain comprises poly(ethylene glycol) and said hydrophobic interacting groups are perfluorinated hydrocarbons.

13. (original) The hydrogel or hydrogel precursor composition of claim 2, wherein said molecule that disrupts an interaction between said physical chemical protecting group and said hydrophobic interacting groups is a molecule that binds

to said physical chemical protecting group better than said hydrophobic interacting groups binds to said physical chemical protecting group.

14. (previously presented) A method for forming a hydrogel in contact with a tissue, said method comprising the steps of:

(a) providing a solution comprising a polymer comprising a water soluble polymer domain having at least two hydrophobic interacting groups attached thereto, wherein said hydrophobic interacting groups bind strongly to each other in an interchain manner to form a hydrogel under physiological conditions, and a physical chemical protecting group that inhibits gel formation of said polymer by preventing said hydrophobic interacting groups from binding strongly in an interchain manner;

(b) providing a molecule that disrupts an interaction between said physical chemical protecting group and said hydrophobic interacting groups;

(c) combining said solution of step (a) with said molecule of step (b) to form a mixture, wherein prior to, during, or after said combining, said solution and said molecule are contacted with a tissue; and

(d) allowing gel formation of the solution of the mixture of step (c) in contact with said tissue.

15. (previously presented) A method for forming a hydrogel in contact with a tissue, said method comprising the steps of:

(a) providing a solution comprising a polymer comprising a water soluble polymer domain having at least two hydrophobic interacting groups attached thereto, wherein said hydrophobic interacting groups bind strongly to each other in an interchain manner to form a hydrogel under physiological conditions, and a water soluble organic solvent, said organic solvent preventing gel formation of said polymer; and

(b) removing all or part of said organic solvent from said solution, wherein prior to, during, or after said removal, said solution and said organic solvent are contacted with a tissue,

wherein said removing of said organic solvent in step (b) allows gel formation of the solution of step (b) in contact with said tissue.

16. (previously presented) A method for forming a hydrogel in contact with a tissue, said method comprising the steps of:

(a) providing a solution comprising a polymer comprising a water soluble polymer domain having at least two hydrophobic interacting groups attached thereto, wherein said hydrophobic interacting groups bind strongly to each other in an interchain manner to form a hydrogel under physiological conditions, and a

water soluble organic solvent, said organic solvent preventing gel formation of said polymer; and

(b) contacting said solution with a tissue; and

(c) allowing at least a portion of said organic solvent to be removed from said solution, wherein said removal of said organic solvent allows gel formation of the solution of step (a) in contact with said tissue.

17. (previously presented) A method for incorporating a sensitive biological material into a hydrogel composition, said method comprising the steps of:

(a) providing a solution comprising a polymer comprising a water soluble polymer domain having at least two hydrophobic interacting groups attached thereto, wherein said hydrophobic interacting groups bind strongly to each other in an interchain manner to form a hydrogel under physiological conditions, and a physical chemical protecting group that inhibits gel formation of said polymer by preventing said hydrophobic interacting groups from binding strongly in an interchain manner;

(b) providing a molecule that disrupts an interaction between said physical chemical protecting group and said hydrophobic interacting groups;

(c) providing a sensitive biological material;

(d) combining said solution with said molecule and said sensitive biological material to form a mixture; and

(e) allowing gel formation of the mixture of step (d).

18. (previously presented) A method for incorporating a sensitive biological material into a hydrogel composition, said method comprising the steps of:

(a) providing a solution comprising a polymer comprising a water soluble polymer domain having at least two hydrophobic interacting groups attached thereto, wherein said hydrophobic interacting groups bind strongly to each other in an interchain manner to form a hydrogel under physiological conditions, and a water soluble organic solvent, said organic solvent preventing gel formation of said polymer;

(b) providing a sensitive biological material; and

(c) combining said sensitive biological material with said solution to form a mixture, wherein prior to, during, or after, said combining, all or part of said organic solvent is removed from said solution,

wherein said removal of said organic solvent results in gel formation of the mixture of step (c).

19. (previously presented) The method of claim 16, wherein said organic solvent is removed by evaporation.

20. (previously presented) The method of claim 16, wherein said organic solvent is removed by diffusion into a bodily fluid.

21. (previously presented) The method of claim 16, wherein said organic solvent is removed by diffusion into an aqueous solution.